

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 1-38 have been rejected. No claims have been amended. Accordingly, Claims 1-38 will be pending in the present application upon entry of this Reply and Amendment.

No new matter has been added.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Drawings

On page 2 of the Office Action, the Examiner objected to the drawings under 37 C.F.R. § 1.83(a). The Examiner stated:

The drawings must show every feature of the invention specified in the claims. Therefore, the vehicle, the timer, the look-up table, the warning signal, etc. must be shown or the feature(s) canceled from the claim(s).

With regard to the term “vehicle,” the Applicants note that this is not a feature of the claimed invention, and is not a positively recited element of the claims. Accordingly, the Applicants do not believe that it is necessary to modify the drawings to include a “vehicle.” It should also be noted that a portion of a vehicle – a “vehicle electrical system 22” – is shown in FIGURE 1 (see paragraph [0017] of the present application), thus at least showing by extension a portion of a “vehicle” in the drawings.

With regard to the term “timer,” the Applicants submit that such term is not included in the claims of the present application. If the Examiner is referring, for example, to Claim 4 (which recites “determining an amount of time that the battery has been at a particular voltage”), the Applicants note that box 28 in FIGURE 2 is labeled “INPUTS,” which as noted in paragraph [0024], may relate to “the voltage, temperature, time, cycling...” The Applicants therefore submit that there is no need to provide a “timer” in the drawings.

With regard to the term “look-up table,” the Applicants note that paragraph [0030] of the present application states “The acceleration factor based on the voltage and temperature of the battery is determined (e.g. predetermined from a lookup table stored in memory of the battery management system)...” (emphasis added). As the “battery management system” is shown both in FIGURES 1 and 2 as box 30, the Applicants submit that there is no need to separately show the “lookup table,” which is included within such battery management system (e.g., in memory).

With regard to the term “warning signal,” the Applicants note that paragraph 19 of the present application states that an “output signal 26 (such as a warning signal) that battery system 20 should be replaced is provided when system 10 predicts that battery system 20 will not likely perform for the intended use” (emphasis added). FIGURE 2 shows the “output signal 26” which may be a “warning signal” as may be recited in various claims of the present application. Accordingly, the Applicants submit that there is no need to show a “warning signal” separate from an “output signal” in the drawings.

The Applicants submit that the objections to the drawings have been overcome. Reconsideration and withdrawal of the objections is therefore respectfully requested.

Specification

On pages 2-3 of the Office Action, the Examiner objected to the Specification. The Examiner stated:

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter: “acceleration factor”; “historical information”; “first state”; “first temperature”; “first state of charge”; “first acceleration factor”; “second acceleration factor”; “second state”, etc. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction is required.

As stated in 37 C.F.R. § 1.75(d)(1), “The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.” The Applicants submit that the terms highlighted by the Examiner find clear support in the

Specification of the present application, and respectfully request reconsideration and withdrawal of the objection to the Specification.

As an initial matter, the Applicants note that each of the terms highlighted by the Examiner (“acceleration factor”; “historical information”; “first state”; “first temperature”; “first state of charge”; “first acceleration factor”; “second acceleration factor”; “second state”) have antecedent basis at least at paragraphs [0007]-[0009] of the present application.

With regard to the term “acceleration factor,” the Applicants submit that various portions of the Specification utilize the term “acceleration factor” (e.g., paragraphs [0028], [0030]-[0033], [0035], etc.). Accordingly, the Applicants submit that the term “acceleration factor” has antecedent basis in the present Specification and therefore satisfies the requirements of 37 C.F.R. § 1.75(d)(1).

With regard to the term “historical information,” the Applicants note that such term has antecedent basis in the present Specification. For example, paragraph [0020] states (with emphasis added):

One way system 10 predicts the amount of life remaining in battery system 20 is based on the monitored history or use of battery system 20. . . . As the battery is in use over time, the battery monitoring system then subtracts a certain amount from the “life” based on the nature of the use. For example, a greater amount of life is subtracted if the battery undergoes a high voltage or temperature. . .

Additionally, paragraph [0023] states “The history of the voltage and temperature of a battery during use is shown in FIGURE 4 according to an exemplary embodiment” (emphasis added). The Applicants submit that one of ordinary skill in the art would have no difficulty ascertaining the meaning of the term “historical information” based on the present Specification.

With regard to the remaining terms highlighted by the Examiner (i.e., “first state”; “first temperature”; “first state of charge”; “first acceleration factor”; “second acceleration factor”; “second state”), the Applicants note that the use of the term “first” and “second” in these terms does not render the meaning of such terms unclear, but instead is a device

intended to differentiate features recited in the same claim (e.g., a “first state” may not be the same as a “second state”). Those of ordinary skill in the art reviewing the description of the present application would understand the meaning of such terms even though such terms use “first” and “second” in the claims. Accordingly, the Applicants submit that such terms have antecedent basis in the present Specification such that one of ordinary skill in the art would understand the meaning of such terms by reviewing the Specification.

Claim Rejections – 35 U.S.C. § 112

On page 3 of the Office Action, Claims 1-38 were rejected under 35 U.S.C. § 112, ¶ 2 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner stated:

Claims 1, 20 and 30: the limitation “acceleration factor” is not clear. The specification describes “the time the battery is at the voltage and temperature is multiplied by the acceleration factor based on voltage and temperature (step 58), resulting in a prediction of the amount of life lost of the battery due to voltage and temperature”, while the specific voltage and temperature, on which the acceleration factor is based, are not defined. In order to continue prosecution it was assumed that the acceleration factor refers to accumulating statistics about the usage of the battery, so that a car owner could be notified when the battery has aged to the point where it is necessary to change the battery. . . .

Claims 20 and 27: “sufficient power” is indefinite.

The Applicants submit that the term “acceleration factor” is not indefinite under 35 U.S.C. § 112 ¶ 2 and would be understood by one of ordinary skill in the art reviewing the present disclosure. Various examples of the use of acceleration factors are described in the present application. For example, paragraph [0025] states (with emphasis added):

The amount of life lost from the battery is determined based on the monitored parameters. If the battery undergoes at a high voltage or temperature during use, the amount of life lost from the battery is accelerated. An acceleration factor based on the voltage and temperature of the battery is pre-determined according to a preferred embodiment. The time the battery is at the voltage and temperature is multiplied by the acceleration

factor based on voltage and temperature (step 58), resulting in a prediction of the amount of life lost of the battery due to voltage and temperature.

Various other examples of the use of acceleration factors are described throughout the present Specification, as will be appreciated by those of ordinary skill in the art. For example, paragraphs [0029]-[0033] and associated Tables 1-4 illustrate the use of acceleration factors according to an exemplary embodiment. The Applicants submit that one of ordinary skill in the art would readily understand what is meant by the term “acceleration factor” as that claim is used in the claims of the present application.

With regard to the use of the term “sufficient power” as used in Claims 20 and 27, the Applicants submit that such term is sufficiently definite to one of ordinary skill in the art to satisfy the requirements of 35 U.S.C. § 112 ¶ 2. For example, Claim 20 more fully recites “to obtain an estimate of the remaining time that the battery will deliver a sufficient amount of power for a vehicle application.” What constitutes a “sufficient amount of power” for a particular application may vary based on the type of application involved (e.g., for a vehicle starting application, this may be a sufficient amount of power to start a vehicle under certain conditions). The term “sufficient amount” is intended by the Applicants to have a broad meaning in accordance with ordinary usage in the relevant art, and it is submitted that such term would be definite to one of ordinary skill in the art pursuant to 35 U.S.C. § 112 ¶ 2.

Accordingly, reconsideration and withdrawal of the rejection of Claims 1-38 under 35 U.S.C. § 112 ¶ 2 is respectfully requested.

Claim Rejections – 35 U.S.C. § 103

On page 4 of the Office Action the Examiner rejected Claims 1-19 as being obvious over U.S. Patent No. 5,349,535 titled “Battery Condition Monitoring and Recording System for Electric Vehicles” to Gupta (“Gupta”) under 35 U.S.C. § 103(a).

The Examiner stated that:

Gupta discloses in figures 1-5 a device 6 for predicting the remaining life of a battery 5 for an electric vehicle comprising obtaining a value representative of the amount of remaining life

for a battery in a new and fully charged state, monitoring at least one parameter of the battery during use of the battery [see also the abstract; column 2, lines 61-66; column 3, lines 51-53; column 4, lines 57-61; column 5, lines 54-58; column 6, lines 39-68; column 7, lines 1-6, 31-50; column 8, lines 16-37, 54-68].

However, the Examiner acknowledged that:

Gupta does not disclose an acceleration factor for the at least one monitored parameter and estimating the amount of life lost from the battery utilizing the acceleration factor. However, Gupta discloses that accumulation of usage history for the battery pack would allow a more accurate “on the fly” estimation of remaining life range--an important factor for the driver.

The Examiner concluded:

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made that Gupta’s device provides an estimated value representative of the amount of remaining life for a battery by using an accumulation of usage history/acceleration factor for the battery in order to allow a driver of the electric vehicle to have adequate information regarding the battery.

Gupta is directed to a “Battery Condition Monitoring and Recording System for Electric Vehicles” and discloses the use of “a microprocessor and associated electronics, sensors and memory to identify and accumulate statistics about the use of a battery pack.” (col. 5, lines 14-16). The “information accumulated is communicated to an external computer or network to be used to bill users of the pack, track pack characteristics and energy usage, estimate remaining pack life, provide a warning of ‘sick’ or abused packs, and to provide the vehicle driver with an indication of remaining range (‘gas gauge’)” (col. 5, lines 30-36).

Claim 1 is in independent form and recites a “method” comprising, in combination with other elements, “obtaining an acceleration factor for the at least one monitored parameter; and estimating the amount of life lost from the battery utilizing the acceleration factor.” Claims 2-19 depend from independent Claim 1.

The “method” recited in independent Claim 1 would not have been obvious in view of Gupta under 35 U.S.C. § 103(a). Gupta does not disclose, teach or suggest a “method” comprising, in combination with other elements, “obtaining an acceleration factor for the at least one monitored parameter; and estimating the amount of life lost from the battery utilizing the acceleration factor.”

As described above, paragraphs [0029]-[0033] and associated Tables 1-4 of the present Specification illustrate the use of acceleration factors according to an exemplary embodiment. Such acceleration factors are not disclosed, taught, or suggested by Gupta, as noted by the Examiner. The Applicants submit that the mere statement in Gupta that “[a]ccumulation of usage history for the battery pack would also allow a more accurate “on the fly” estimation of remaining range” does not provide a teaching or suggestion to utilize an “acceleration factor” as recited in Claim 1. To transform the “Battery Condition Monitoring and Recording System for Electric Vehicles” of Gupta into a “method” as recited in Claim 1 would require still further modification, and such modification is taught only by the Applicants’ own disclosure.

The “method” recited in independent Claim 1, considered as a whole, would not have been obvious in view of Gupta. The rejection of Claim 1 over Gupta under 35 U.S.C. § 103(a) is improper. Therefore, Claim 1 is patentable over Gupta. Dependent Claims 2-19, which depend from independent Claim 1, are also patentable. See 35 U.S.C. § 112 ¶ 4.

The Applicants respectfully request withdrawal of the rejection of Claims 1-19 under 35 U.S.C. § 103(a).

* * *

It is submitted that each outstanding objection and rejection to the Application has been overcome, and that the Application is in a condition for allowance. The Applicants request consideration and allowance of all pending Claims 1-38.


The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

Date 11/17/2004

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